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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,517	04/29/2002	Gerhard E. Welsch	CWR 2 0269	4366

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EXAMINER	
DOVE, TRACY MAE	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/914,517	WELSCH ET AL.	
	Examiner	Art Unit	
	Tracy Dove	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *15-27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 April 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-14, drawn to a battery.

Group II, claim(s) 15-25 (including both first claim 22 and second claim 22), drawn to a method of conducting a reaction on a surface.

Group III, claim(s) 26, drawn to a metal sponge with high specific surface area.

Group IV, claim(s) 27, drawn to a metal sponge with a geometry.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of Group I is an anode or cathode comprising an electrically conductive sponge material.

The technical feature of Group II is the step of growing a sponge material having a plurality of open pores which is not specifically adapted for the anode or cathode material of Group I.

The technical feature of Group III is a metal sponge with high specific surface area which is not adapted for the anode or cathode material of Group I and not made by the method of Group II.

The technical feature of Group IV is a metal sponge with a geometry of open porosity between dendrites which is not adapted for the anode or cathode material of Group I, not made by the method of Group II and not related to Group III.

During a telephone conversation with Ann Skerry on 2/13/04 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 15-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

The drawings are objected to because Figures 11A, 11B, 11C and 11D described on page 3 of the specification are not contained in the application. There are seven drawing sheets labeled 1/7-7/7 without any of the seven pages missing. The objection to the drawings will not be held in abeyance.

Priority

Note this application claims benefit to provisional application 60/124,443 filed on 3/15/99. The provisional application has been reviewed by the Examiner to determine if the disclosure of the invention in the provisional application is sufficient to entitle Applicant to the priority date. The provisional application has sufficient disclosure and Applicant is entitled to the priority date of 3/15/99.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6, 8, 10 and 12-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Bando et al., US 5,965,295.

Bando teaches an alkaline secondary battery comprising a positive electrode, a negative electrode and an alkaline electrolyte. The positive electrode includes an active material applied to a conductive substrate (metallic porous body). The metallic porous body may be formed of a sponge-like, fibrous or felt-like metallic porous body which is made from a metal such as nickel or stainless steel, or a nickel-coated resin (col. 7, lines 7-10). The negative electrode includes an active material applied to a conductive substrate. The conductive substrate may be a two-dimensional substrate such as a punched metal, expanded metal and a nickel net, or a three-dimensional substrate such as a felt-like porous metallic substrate or a sponge-like porous metallic substrate (col. 7, lines 51-55). A laminate structure comprising the two-dimensional

substrate and the three-dimensional substrate applied to the surfaces of the two-dimensional substrate may be employed as the conductive substrate of the negative electrode or the positive electrode (col. 11, lines 62-col. 12, lines 6 and col. 11, lines 24-35). Bando teaches a sponge-like three-dimensional substrate which was made of nickel and applied on the opposed surfaces (plural layers) of a two-dimensional substrate (nickel sheet) to prepare a conductive substrate. The three dimensional substrate employed in an example of Bando was 0.8 mm is thickness, 98% in porosity and 100 g/m^2 in weight per unit area (col. 33, lines 5-14).

Regarding claims 10, 12 and 13, the three-dimensional sponge substrate of Bando inherently contains dendrites because it is a three-dimensional material with a porosity of 98%.

Regarding claim 14, the three-dimensional sponge substrate is coated with a positive active material layer or a negative active material layer. Both the positive active material layer and the negative active material layer contain electrically conductive material.

Thus the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 102(e)/103(a) as being anticipated by and, alternatively, unpatentable over Bando et al., US 5,965,295.

See discussion of Bando above regarding claims 1 and 2. Thus the claim is anticipated.

The claim is alternatively unpatentable because the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. In re Fessman. Bando does not explicitly state the three-dimensional sponge material is grown on the two-dimensional substrate. However, this is a product-by-process claim and is therefore obvious.

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Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bando et al., US 5,965,295 in view of Reichman et al., US 6,171,726 B1 and/or Kimiya et al., US 6,013,390.

Bando teaches an alkaline secondary battery comprising a positive electrode, a negative electrode and an alkaline electrolyte. The positive electrode includes an active material applied to a conductive substrate (metallic porous body). The metallic porous body may be formed of a sponge-like, fibrous or felt-like metallic porous body which is made from a metal such as nickel or stainless steel, or a nickel-coated resin (col. 7, lines 7-10). The negative electrode includes an active material applied to a conductive substrate. The conductive substrate may be a two-dimensional substrate such as a punched metal, expanded metal and a nickel net, or a three-dimensional substrate such as a felt-like porous metallic substrate or a sponge-like porous metallic substrate (col. 7, lines 51-55). A laminate structure comprising the two-dimensional substrate and the three-dimensional substrate applied to the surfaces of the two-dimensional substrate may be employed as the conductive substrate of the negative electrode or the positive electrode (col. 11, lines 62-col. 12, lines 6 and col. 11, lines 24-35). Bando teaches a sponge-like three-dimensional substrate which was made of nickel and applied on the opposed surfaces (plural layers) of a two-dimensional substrate (nickel sheet) to prepare a conductive substrate.

The three dimensional substrate employed in an example of Bando was 0.8 mm is thickness, 98% in porosity and 100 g/m^2 in weight per unit area (col. 33, lines 5-14).

Bando does not explicitly state the two-dimensional substrate comprises silver, copper or aluminum (claim 5). Bando does not explicitly state the three-dimensional sponge material comprises copper, silver, gold, aluminum or combinations thereof.

However, Reichman teaches an alkaline battery comprising an electrode including an electrically conductive substrate used to hold an active material. Examples of substrates include foam, grid, plate, foil, expanded metal or any other type of support structure. The electrically conductive material of the substrate may be nickel, nickel alloy, copper, copper alloy, nickel-plated metals such as nickel-plated copper and copper plated metal nickel (col. 5, lines 66-col. 6, lines 14).

Furthermore, Kimiya teaches an alkaline battery comprising an electrode including a foamed nickel substrate filled with an active material. The substrate may be foamed nickel or other three-dimensional metal porous substrates like nickel felt or two-dimensional metal porous plates. The nickel substrate may be nickel with at least one metallic element selected from the group consisting of Mn, Al, Co, Cr, Fe, Zr and Bi (col. 13, lines 37-44).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to modify the composition of the conductive substrate of Bando because the actual material used for the substrate depends upon many factors including whether the substrate is being used as the positive or negative electrode, the potential of the electrode and the pH of the electrolyte (Reichman col. 6, lines 10-14). One of skill would have been motivated to combine the teaching

of Bando with Reichman and/or Kimiya because all three references teach conductive substrates for alkaline batteries. Reichman teaches a nickel-copper conductive substrate for use in alkaline cells is known in the art. Kimiya teaches a nickel-aluminum conductive substrate for use in alkaline cells is known in the art.

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Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bando et al., US 5,965,295.

See discussion of Bando above regarding claims 1 and 2.

Bando does not explicitly state the width of the individual dendrites.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because changes in size/proportion, in the absence of a showing of critically, are considered obvious. The courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. See MPEP 2144.04.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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February 13, 2004